

Spot Safety Project Evaluation

Project Log # 200505135

Spot Safety Project # 06-94-201

**Spot Safety Project Evaluation, of the Pavement Resurfacing and Wedging of a Curve
Located on NC 87, 0.5 miles southeast of SR 1712-Libson Road, in Bladen County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation

Principal Investigator

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Traffic Safety Project Engineer

08/02/2005
Date

Spot Safety Project Evaluation Documentation

Subject Location

Evaluation of Spot Safety Project Number 06-94-201 – Curve Located on NC 87, 0.5 miles southeast of SR 1712, in Bladen County

Introduction

In an attempt to assess the safety of our roads, the Safety Evaluation Group of the Traffic Safety Systems Management Section has evaluated the above project. The methodologies used in this evaluation offer various philosophies and ideas, in an effort to provide objective countermeasure crash reduction results. A naive before and after analysis has been completed to measure the effectiveness of the spot safety improvement. Additional analysis methods were not utilized for this evaluation because a suitable comparison group was unattainable. This information is provided to you so the benefit or lack of benefit for this type of project can be recognized and utilized for future projects.

Project Information and Background from the Project File Folder

The spot safety project improvement countermeasures chosen for the subject location were the wedging of the curve to provide superelevation and pavement resurfacing to increase skid resistance. R.E. Crumpler, District Engineer originally requested the improvements. NC 87 is a two-lane roadway with a posted speed limit of 55 mph in the vicinity of the curve. Three foot paved shoulders and nine foot soil shoulders are provided. A pattern of Ran-Off Road Crashes arose during wet pavement conditions. The curve was not superelevated properly to guide motorists' through this section of roadway.

The initial crash analysis for this location was completed from January 1, 1987 through June 30, 1994 with a total of 18 reported crashes. There were 15 Ran-Off Road Crashes, two Head-On Crashes, and one Random Type Crash. Two fatalities, five class A, five class B, and 15 class C injuries resulted. In addition, 17 of the 18 crashes occurred during wet conditions. The final completion date for the improvement at the subject intersection was on December 22, 1997.

Naïve Before and After Analysis

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from November 1, 1997 through February 28, 1998. The before period consisted of reported crashes from January 1, 1991 through October 31, 1997 (6 Years, 10 Months) and the after period consisted of reported crashes from March 1, 1998 through December 31, 2004 (6 Years, 10 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The following data table depicts the Naive Before and After Analysis for the above information. The treatment data consists of a 0.2-mile strip on NC 87, surrounding the treatment curve. Please see the attached *Location Map* for further detail. Please note that the before period ADT year was 1994, and the after period ADT year was 2001.

Treatment Information	Before	After	Percent Reduction (-)/
			Percent Increase (+)
Total Crashes	18	2	-88.9
Total Severity Index	13.53	4.7	-65.3
Correctable Crashes*	17	0	-100.0
Volume	2300	3000	30.4
Crash Type Summary	Before	After	Percent Reduction (-)/
			Percent Increase (+)
Animal	0	1	n/a
Head On	2	0	-100.0
Left Turn, Different Roadway	0	1	n/a
Left Turn, Same Roadway	1	0	-100.0
Ran Off Road - Left	10	0	-100.0
Ran Off Road - Right	4	0	-100.0
Sideswipe, Opposite Direction	1	0	-100.0

* Correctable Crashes include Head On, Ran Off Road, and Sideswipe Crashes that occurred during wet pavement conditions.

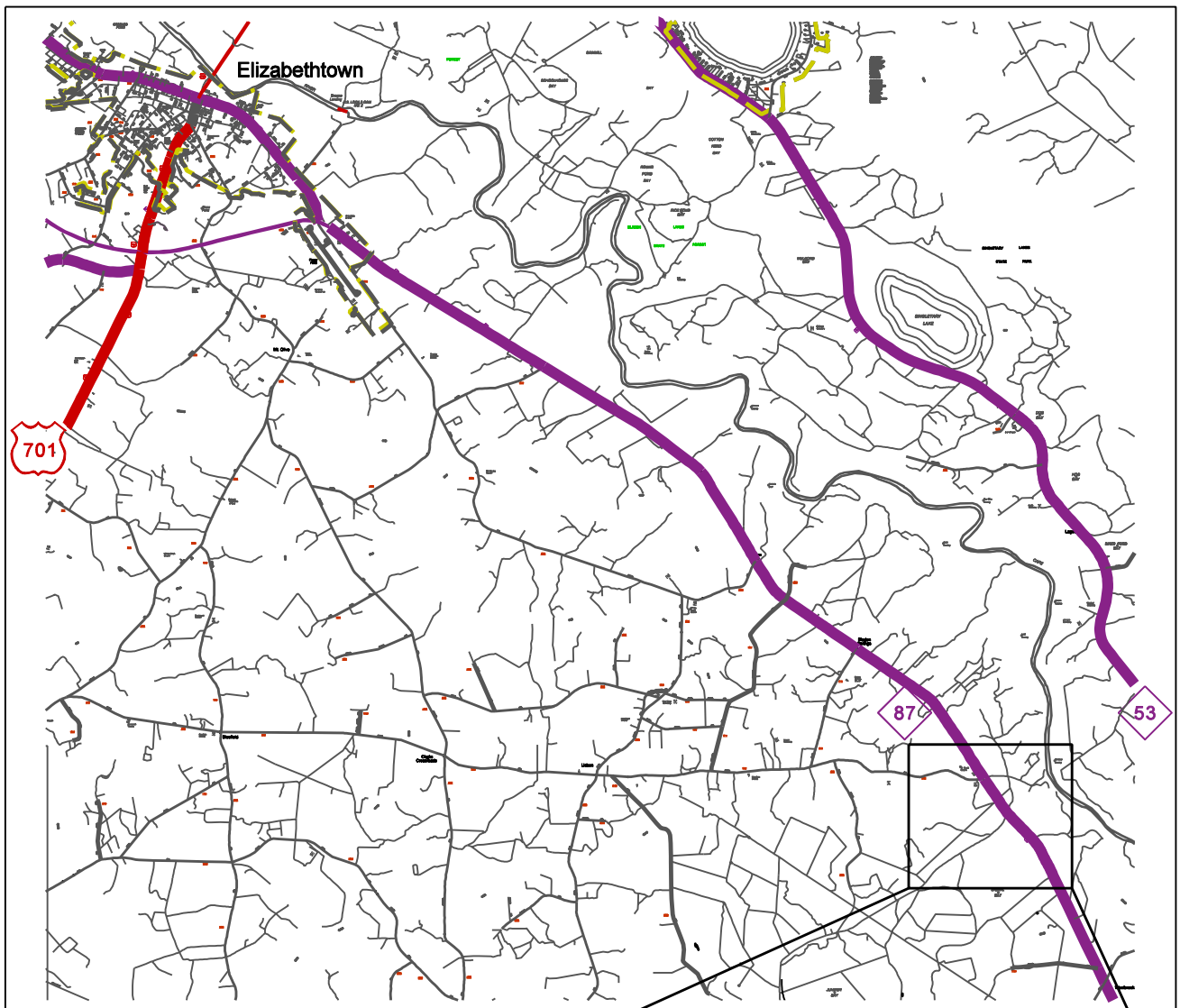
The naive before and after analysis at the treatment location resulted in an 88.9 percent decrease in Total Crashes, a 65.3 percent decrease in the Total Severity Index, and a 30.4 percent increase in Average Daily Traffic (ADT). In addition, the number of Correctable Crashes decreased from 17 crashes in the before period to none in the after period. All Correctable Crash Types decreased by 100 percent from the before to the after period.

Results and Discussion

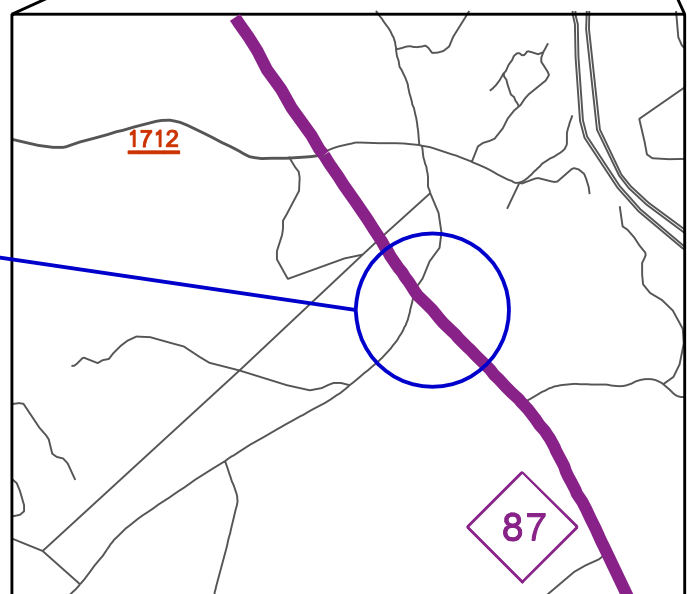
The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in an 88.9 percent decrease in Total Crashes and a 100.0 percent decrease in Correctable Crashes. The number of injuries associated with Correctable Crashes went from one fatality and twenty-four non-fatal injuries in the before period to no reported injuries in the after period. The summary results above demonstrate that the treatment location appears to have had a substantial decrease in the number and severity of crashes from the before to the after period.

Please see the attached *Treatment Site Location Photo*. A recent photo driving northwest at the treatment curve is provided. The countermeasure crash reduction for Total Crashes at the subject intersection is an 88.9 percent decrease. As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors.

***Evaluation of Spot Safety Project Number 06-94-201
Location Map, Near Elizabethtown, Bladen County***



***Treatment Site:
Located on NC 87, 0.5 Miles
Southeast of SR 1712-Libson Road***

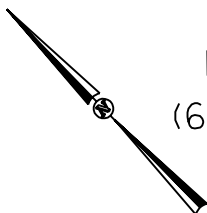


Treatment Site Photo (Taken on June 13, 2005)



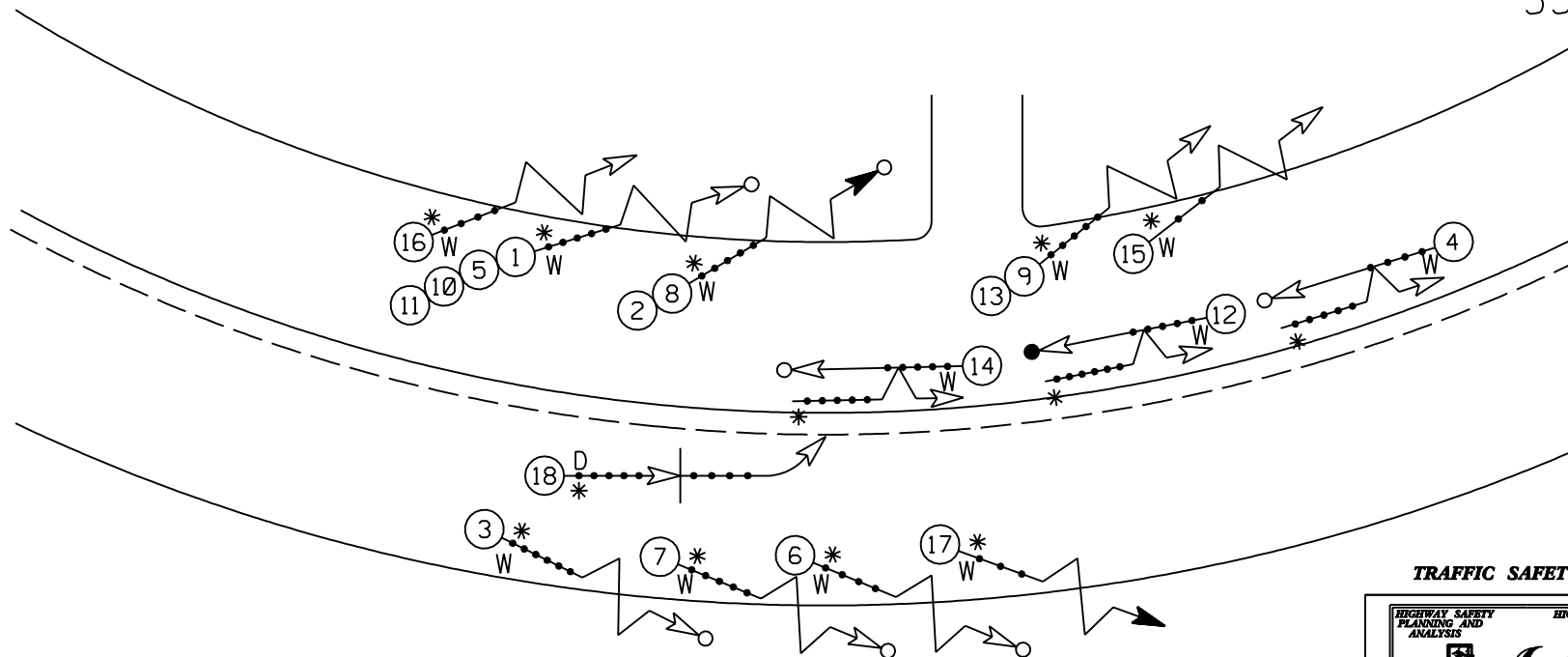
Looking Northwest on NC 87 at the Treatment Location

SS 06-94-201
 Treatment Site - TotalCrashes
 Before Period
 1/1/1991 - 10/31/1997
 (6 years, 10 months)



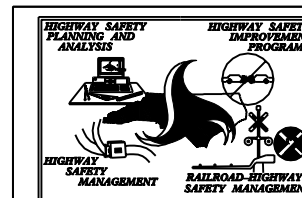
LEGEND			
	MOVING VEHICLE		ANGLE
	PEDESTRIAN		TURNING
	PAKED VEHICLE		BACKING
	PARKING VEHICLE		SIDESWIPE
	DEER		OUT OF CONTROL
	FIXED OBJECT		INJURY
	HEAD ON		FATALITY
	REAR END		SPEED UNKNOWN
	RAN OFF ROAD		9 MPH OR LESS
			10 MPH TO 19
			20 MPH TO 29
			30 MPH TO 39
			40 MPH TO 49
			50 MPH TO 59
			60 MPH TO 69
			70 AND UP
			SPEED UNKNOWN
			P PEDESTRIAN
			T TRAIN
			• DRIVER AT FAULT
			D DRY
			W WET
			I ICY OR SNOWY
			O ONLY

NC 87
 55 mph



To SR 1712-Libson Rd

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT



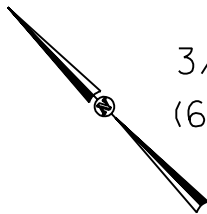
COLLISION DIAGRAM	
DIVISION:	AREA:
STUDY PERIOD: 01/01/91 - 10/31/97	
DISTANCE: Y-LINE = 150 ft	
ANALYSIS PREPARED BY: CLG	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: CLG	
DIAGRAM REVIEWED BY:	

SS 06-94-201Before

SCALE: NOT TO SCALE
DATE: 8/2/2005
LOG NUMBER: 200505935

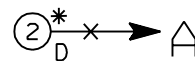
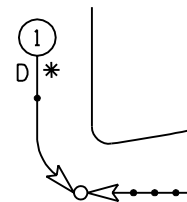
N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH

SS 06-94-201
 Treatment Site - TotalCrashes
 After Period
 3/1/1998 - 12/31/2004
 (6 years, 10 months)



LEGEND			
	MOVING VEHICLE		ANGLE
	PEDESTRIAN		TURNING
	PARKED VEHICLE		BACKING
	PARKING VEHICLE		SIDESWIPE
	DEER		OUT OF CONTROL
	FIXED OBJECT		MAJORITY
	HEAD ON		FATALITY
	REAR END		9 MPH OR LESS
	RAN OFF ROAD		10 MPH TO 19
			20 MPH TO 29
			30 MPH TO 39
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			50 MPH TO 59
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			70 AND UP
			SPEED UNKNOWN
			P PEDESTRIAN
			T TRAIN
			* DRIVER AT FAULT
			D DRY
			W WET
			I ICE OR SNOW
			O ONLY

NC 87
 55 mph



To SR 1712-Libson Rd

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

COLLISION DIAGRAM	
DIVISION:	AREA:
STUDY PERIOD: 03/01/98 - 12/31/04	
DISTANCE: Y-LINE = 150 ft	
ANALYSIS PREPARED BY: CLG	
ANALYSIS CHECKED BY:	
DIAGRAM PREPARED BY: CLG	
DIAGRAM REVIEWED BY:	
SCALE: NOT TO SCALE	
DATE: 8/2/2005	
LOG NUMBER: 200505035	

SS 06-94-201After

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH